

BOTANY.—*New South American Verbesininae*.¹ S. F. BLAKE, Bureau of Plant Industry.

Of the thirteen new species of South American Verbesininae described in this paper, seven are based on specimens from the extensive collections made in northern Peru by J. Francis Macbride and William Featherstone on the Capt. Marshall Field expeditions sent out by the Field Museum of Chicago. Three of the others are from a small collection made by G. H. H. Tate, of the American Museum of Natural History, in the mountains of northeastern Venezuela, and one is from the Colombian collections of Dr. F. W. Pennell. The two remaining species are based on old specimens in the Kew Herbarium, collected by William Purdie and A. Mathews in Colombia and Peru respectively, and lent the writer for study by the Director of Kew Gardens, Dr. A. W. Hill.

Jaegeria axillaris Blake, sp. nov.

Small glabrous herb, repent at base; leaves lance-elliptic, connate-clasping, serrulate; heads small, solitary, axillary, on peduncles shorter than the leaves; rays 5, usually shorter than the narrowed tips of the phyllaries.

Perennial (?), 15 cm. long or less, light green, simple or sparsely branched, repent below, the tips apparently ascending; internodes 3 to 30 mm. long; leaves opposite, lance-elliptic, 1.2 to 1.8 cm. long, 3 to 7 mm. wide, narrowed to the callous obtuse apex, cuneate-rounded and connate at base, remotely serrulate with blunt callous teeth or subentire, 3-ple- or 5-plinerved and reticulate (the veins conspicuous in transmitted light); peduncles slender, erect, 3 to 10 mm. long; heads 3.5 to 4 mm. high, 2.5 to 4.5 mm. wide; phyllaries 5, lance-ovate (in their natural position), with subherbaceous 3 to 5-nerved body, glabrous dorsally, hirsute on the sides, and thin scarious ciliate margins infolded about the achenes, abruptly contracted above, and more or less 3-lobate, the central lobe subherbaceous, triangular, acuminate to an obtuse apex, erect to spreading, 1 to 1.5 mm. long; rays 5, light yellow, fertile, essentially glabrous, the tube 0.4 mm. long, the lamina suborbicular, 1.2 mm. long and wide, 3-dentate, 3 to 5-nerved; disk flowers 8, their corollas pale yellow, sparsely pilose on tube, 4 or 5-toothed, 1.5 mm. long (tube 0.4 mm., throat campanulate, 0.8 mm., teeth deltoid, 0.3 mm.); pales broad, abruptly short-pointed, arose above, about 7-nerved, 3.5 mm. long; ray achenes oblong, 2.2 mm. long, obcompressed, blackish, glabrous, bearing a callous half-collar 0.1 mm. high at apex; disk achenes compressed or subquadrangular, 2.2 mm. long, blackish, glabrous, bearing a very short apical collar.

Type in the herbarium of the New York Botanical Garden, collected in wet meadows southwest of Las Cruces, Bogotá, Dept. Cundinamarca, Colombia, alt. 2600–2700 meters, September 24–25, 1917, by F. W. Pennell (no. 2171). Duplicate in U. S. National Herbarium, no. 1,042,157.

When the internodes are short and the leaves crowded the plant is suggestive of *Aphanactis jamesoniana* Wedd. in appearance.

¹ Received March 9, 1926.

Aphanactis villosa Blake, sp. nov.

Cespitose perennial, densely flavescent-villous; leaves crowded, narrowly elliptic, entire, 3-nerved; peduncles becoming 2 cm. long; phyllaries densely villous at least above.

Stems several, prostrate or ascending, 6 cm. long or less, branched, slender, densely flavescent-villous; internodes at first very short, becoming 4 to 12 mm. long; leaves opposite, sessile, contracted into sheathing, scarious, glabrate or glabrescent, connate bases, obtusely callous-tipped, 3 to 5-plinerved, thickish, the lower up to 13 mm. long, 4 mm. wide, the middle and upper smaller, elliptic or elliptic-spatulate, 4 to 9 mm. long, 1.5 to 2.5 mm. wide, all densely flavescent-villous; heads subglobose, about 3.5 mm. high and thick, solitary, axillary and terminal, in anthesis subsessile, the peduncles in age becoming 2 cm. long, naked or bearing a leafy bract; phyllaries 6, about 2-seriate, appressed, the outermost one shorter, ovate, acutish, 2.8 mm. long, 1.5 mm. wide, 5-nerved, subherbaceous except for the slightly indurated base, densely villous and ciliate, the next 4 equal, broadly oval, obtuse, 3 mm. long, 2 mm. wide, with similar texture and pubescence, the inmost one oblong, 3 mm. long, 1.5 mm. wide, pilose along middle, scarious-margined, not ciliate, erose at tip; receptacular pales aristiform-subulate, about 2.5 mm. long, 0.2 mm. wide toward base, glabrous, 1-nerved; pistillate corollas 5, greenish yellow, densely long-villous on tube, sparsely so on limb, barely surpassing the involucre, 2.2 mm. long (tube 1.5 mm., lamina erect, cuneate, 3-toothed, 0.7 mm. long and about as wide); disk corollas 3 or 4, greenish yellow, densely long-villous on tube, glabrous above, 4 or 5-toothed, 1.8 mm. long (tube 0.7 mm., throat slightly broader, 0.7 mm., teeth deltoid, 0.4 mm.); ray achenes obovoid-oblong, 1.4 mm. long, plump, biconvex, slightly obcompressed, obscurely about 5-angled, glabrous, fuscous, epappose; disk achenes obovoid or elliptic-oblong, 1.2 to 1.5 mm. long, somewhat compressed, about 4-angled, multistriatulate, glabrous, epappose.

Type in the herbarium of the Field Museum, no. 534367, collected on grassy subalpine slopes at Chasqui, Dept. Huánuco, Peru, April 10, 1923, by J. F. Macbride (no. 3297). Duplicate in the U. S. National Herbarium, no. 1,191,439.

Readily distinguished by its dense pubescence and at length elongate peduncles. The genus, of which only one species has hitherto been described, has not previously been known south of Ecuador.

Montanoa lehmannii (Hieron.) Blake.

Eriocoma (*Montanoa*) *lehmannii* Hieron. Bot. Jahrb. Engler 19: 54. 1894.

Related to *Montanoa quadrangularis* Schultz Bip. In *M. lehmannii* the leaves are densely prominulous-reticulate beneath, and the fruiting pales are provided at the retuse apex with a comparatively short and stout cusp about 0.5 mm. long. In *M. quadrangularis* the leaves are not densely prominulous-reticulate beneath, and the retuse fruiting pales have a slender, longer cusp, usually 1 to 1.5 mm. long. Specimens collected by M. T. Dawe (no. 700) in the Kew Herbarium show that the "arboloco" recently described by him² as an important source of timber and wood for billiard cues in Colombia is *M. lehmannii* and not *M. moritziana* Schultz Bip., as which his specimens were identified at Kew. The latter name, which has never been published with a description, belongs in the synonymy of *M. quadrangularis*.

² See RECORD, *Tropical Woods* 2: 13. 1925.

A photograph and fragments of a specimen in the Kew Herbarium of *Lehmann* 7480. type collection of *E. lehmannii*, are now in the National Herbarium.

Viguiera leptodonta Blake, sp. nov.

Section *Diplostichis*; herb; stem loosely sordid-pilose; leaves opposite, ovate, slender-petioled, hirsute-pilose; heads small, several or numerous in terminal cymose panicles; involucre strigillose, 5 mm. high; achenes sparsely hispidulous; pappus of 2 awns and usually 4 narrow squamellae.

Stem subterete (3 to 4.5 mm. thick), 65 cm. high and more, probably lax or sprawling, branched, striate, white-pithy, loosely and rather densely pilose with dull white, several-celled, spreading hairs, glabrescent below; internodes 4 to 14.5 cm. long; leaves opposite essentially throughout; petioles slender, naked, densely hirsute-pilose, glabrescent, 1 to 2.5 cm. long; blades ovate, 6 to 11.5 cm. long, 2.5 to 6.5 cm. wide, acuminate, somewhat falcate, at base broadly rounded to cuneate-rounded, crenate-serrate practically throughout (teeth depressed, 3 to 4 per cm., the apiculate tips about 0.5 mm. long), membranous, above dark green, evenly but not densely hirsute with somewhat antrorse-curved white hairs with small tuberculate bases, beneath slightly lighter green, evenly but not densely hirsute-pilose on surface with spreading scarcely tuberculate-based hairs, densely so along the veins, tripli- or quintuplinerved essentially from base and loosely prominulose-reticulate; panicles terminating stem and branches, usually ternately divided, 3.5 to 7 cm. wide, about 15-headed, the principal branches subtended by somewhat reduced leaves, the other bracts filiform, 7 mm. long or less, the chief branches pubescent like the stem, the pedicels densely appressed-pubescent, 4 to 15 mm. long; heads 1.5 to 2 cm. wide; disk at first cylindric-oblong, becoming subglobose in fruit, in flower 8 to 10 mm. high, 5 to 7 mm. thick, in fruit about 1 cm. thick; involucre 2-seriate, equal or slightly unequal, 4.5 to 5 mm. high, the phyllaries 10, lanceolate or lance-ovate (1 to 1.5 mm. wide), sharply acuminate, subherbaceous, blackish green, densely strigillose, the outer with somewhat divergent tips; rays 8, yellow, neutral, pilose on tube and on nerves of back, the tube 1.5 mm. long, the lamina elliptic, 2-denticulate, 10 mm. long, 3 mm. wide, 7-nerved; disk flowers about 21, their corollas yellow, finely hispidulous throughout, short-hirsute on teeth, 6.5 mm. long (tube 1.3 mm., throat cylindric, 4.3 mm., teeth ovate, 0.9 mm.); pales acute, mucronulate, blackish green with scarious margins, hispidulous along middle, 7 mm. long; ray achenes (inane) trigonous, hispidulous, epappose; disk achenes obovate, strongly compressed, sparsely hispidulous especially above, 3 mm. long, 1.2 mm. wide; awns 2, slender, subequal, denticulate below, 4 mm. long; squamellae lanceolate, acute, lacerate, 1.5 to 2 mm. long, a pair at base of each awn and often 1 or 2 much smaller ones on one side between them.

Type in the U. S. National Herbarium, no. 1,230,823, collected along dry trail at Carapas, Sucre, Venezuela, alt. 1680 meters, in 1925, by G. H. H. Tate (no. 27). Additional specimen, with same data, collected under no. 26.

The only species of *Viguiera* hitherto known from Venezuela is *V. mucronata* Blake, to which and to *V. anomala* Blake, of Colombia, *V. leptodonta* is most closely related. In *V. mucronata* the stem hairs are all or mostly appressed, the achenes densely silky-pilose, the squamellae 4, broad and rounded, covering the whole apex of achene, and the disk corollas much shorter. In *V. anomala* the stem pubescence is denser and more sordid, the heads are narrower and fewer-flowered, and the achene is glabrous. The name of the new species refers to the slender apiculations of the leaf-teeth.

Viguiera pusilla astephana Blake, var. nov.

Achenes glabrous, epappose; otherwise as in the typical form.

Type in the herbarium of the Field Museum, no. 534812 (in part), collected in loose soil on slopes, Yanano, Dept. Huánuco, Peru, alt. about 1830 meters, May 13-16, 1923, by J. F. Macbride (no. 3750 in part). Duplicate in the U. S. National Herbarium, no. 1,191,464 (in part).

The sheet in the Field Museum bears 3 specimens, one with the pappus and pubescent achene of *Viguiera pusilla* (A. Gray) Blake, the others precisely similar except for the glabrous, epappose achenes. The National Herbarium sheet bears one specimen of each form. The plant is of particular interest from the fact that no epappose form has hitherto been known in the large section *Paradosa*, including nearly half the species of the genus.

Viguiera macbridei Blake, sp. nov.

Series *Aureae*; stems stout, very leafy, densely and canescently spreading-pilose; leaves alternate, narrowly lanceolate, acuminate, short-petioled, revolute-margined, bullate above, densely and canescently pilose-tomentose beneath; heads several or numerous, cymose-panicled, medium-sized; involucre graduate, 7 to 9 mm. high, hispid-pilose.

Herb, 1.3 to 1.6 m. high, several-stemmed; stems strict, subterete (4 to 8 mm. thick), striatulate, pithy, glabrate below, above densely pilose or hirsute-pilose with spreading or loosely reflexed white hairs 2 to 4 mm. long, with small tuberculate bases, and between them appressed- or ascending-pilose with shorter hairs; internodes mostly 3 to 10 mm. long; leaves alternate (except perhaps at extreme base); petioles stout, naked, 1 to 2 mm. long, densely hispid-pilose like the stem; blades narrow-lanceolate or linear-lanceolate, 5 to 6.5 cm. long, 5 to 13 mm. wide, acuminate, cuneate or rounded at base, subentire, strongly revolute-margined, subcoriaceous, above dark green, shining in age, harshly pilose-hispid with tuberculate-based antrorse hairs, beneath densely and canescently pilose-tomentose (the costa glabrate except for the persistent tuberculate hair-bases), triplinerved and with numerous pairs of lateral veins, these impressed above, mostly concealed beneath by the tomentum; heads about 2.8 cm. wide, 5 to 16 at apex of stem, terminal and on 1 to 4-headed axillary branches 5 to 15 cm. long, bearing reduced leaves, the pedicels or peduncles 4 cm. long or less; disk subglobose, 1 to 1.5 cm. high, 1 to 1.8 cm. thick; involucre 3 to 4-seriate, graduate, 7 to 9 mm. high, the phyllaries oblong-ovate to oblong (2 to 3 mm. wide), acute, appressed or with short spreading tips (glabrous inside), blackish green and subherbaceous with paler, more indurate base, 1-ribbed, densely hispid-pilose and ciliate with subappressed partly deciduous hairs with persistent tuberculate bases; receptacle rounded; rays about 8, golden yellow, neutral, pubescent on tube and nerves of back, the tube 1.3 mm. long, the lamina oval, 16 mm. long, 7.5 mm. wide, 3-denticulate, 12 or 13-nerved; disk flowers very numerous, their corollas yellow, pubescent chiefly on tube, base of throat, and back of teeth, 5.2 to 6.2 mm long (tube 1.2 to 1.8 mm., throat cylindrical, 2.8 to 3.2 mm., teeth ovate, papillose-margined, 1 to 1.2 mm.); pales acute, carinate, blackish green and hispidulous above, 9 mm. long; ray achenes (inane) trigonous, with a pappus of about 6 lacerate squamellae up to 1.2 mm. long; disk achenes obovate-oblong, compressed, blackish, rather sparsely subappressed-pilose, 4 mm. long, 1.2 mm. wide; awns 2, slender, hispidulous, very unequal, 1.8 to 3 mm. long; squamellae of each side of achene connate into a lacerate scale 1 mm. long.

Type in the herbarium of the Field Museum, no. 535145, collected on steep rocky western grasslands, Huacachi, near Muña, Dept. Huánuco, Peru, alt. about 1980 meters, May 20-June 1, 1923, by J. F. Macbride (no. 4078). Duplicate in U. S. National Herbarium, no. 1,191,485.

A very distinct species of the Subseries *Euaureae*, related to *Viguiera sodiroi* (Hieron.) Blake and *V. mollis* Griseb., of Ecuador and Argentina respectively, but distinguished from both by its narrowly lanceolate leaves, as well as by other characters.

***Helianthus acuminatus* Blake, sp. nov.**

Shrub; young branches densely griseous-pilose; leaves opposite, ovate, slender-petioled, acuminate, rounded at base, subentire, densely griseous-tomentose beneath; heads rather large; involucre about 13 mm. high, of oblong, acute or acuminate, cinerascens-puberulous and sparsely pilose phyllaries; disk corollas yellow or yellowish throughout.

Apparently tall; stem stout (up to 6 mm. thick), subterete, striatulate, glabrous or glabrate, with mostly opposite branches; young branches very densely pilose, almost tomentose, with mostly spreading whitish or griseous hairs with small tuberculate bases; internodes of main stem 6 to 10 cm. long, of the young leafy branches 1 to 2 cm.; leaves opposite practically throughout except in the inflorescence; petioles 0.8 to 1.8 cm. long, slender, densely pilose-subtomentose; blades ovate, 4 to 7 cm. long, 2.8 to 4.3 cm. wide, falcate-acuminate, at base broadly rounded, subtruncate, or subcordate, very shortly or not at all decurrent on the petiole, obscurely serrulate (teeth 4 to 5 per cm.) or subentire, firm, above green or blackish green, densely and rather softly short-pilose with antrorse, shining hairs with small glandular-tuberculate bases, beneath densely and softly griseous-tomentose, triplinerved essentially from base; heads about 3.8 cm. wide, axillary and terminal, 1 to 5 toward tips of stem and branches, on stout upwardly somewhat thickened spreading-pilose peduncles 1 to 14 cm. long; disk subglobose, 1.3 to 1.5 cm. high, 1.2 to 2 cm. thick; involucre about 4-seriate, graduate, 1.2 to 1.4 cm. high, the phyllaries oblong (2.8 to, in age, 5.5 mm. wide), acute or acuminate, blackish green, obscurely herbaceous above, the inner with loose tips, all densely and cinerascens appressed-puberulous and pilosulous, somewhat pilose above, glabrescent in age, about 3-nerved; rays 14 or more, yellow, neutral, pubescent on tube and nerves of back, the tube 2 mm. long, the lamina oblong-elliptic, 2-dentate, 2 cm. long, 6 mm. wide; disk corollas yellow throughout or greenish on the teeth, pilosulous chiefly toward base of tube, along nerves above, and on teeth, 7.5 mm. long (tube 1.5 mm., throat cylindric, 5.2 mm., teeth deltoid, 0.8 mm.); pales acute, usually mucronulate, pilosulous chiefly along the narrow keel above, 11 mm. long; achenes oblong-obovate, compressed, blackish, glabrous, 3.8 mm. long, 1.5 mm. wide; awns 2, lanceolate, hispidulous-ciliolate, caducous, 3 mm. long; rays achenes (inane) with 2 less caducous, lacerate squamellae 1 mm. long.

Type in the herbarium of the Field Museum, no. 518863, collected on open, moist, rocky slope at Tomaiquichua, a pueblo three miles below Ambo, Dept. Huánuco, Peru, alt. about 2590 meters, September 19, 1922, by J. F. Macbride and W. Featherstone (no. 2429). Duplicate in U. S. National Herbarium, no. 1,198,894.

Allied to *Helianthus grandiceps* Blake, of Ecuador, which has alternate leaves with cuneate or rounded-cuneate base, more definitely toothed, and with the lateral nerves arising distinctly above the base, and longer involucre;

also to *H. jelskii* Hieron., of Peru, in which the leaves are much thicker, and densely ochroleucous-lanate-tomentose and lacunose-reticulate beneath.

***Helianthus discolor* Blake, sp. nov.**

Shrub; branches appressed-pilose, glabrate or glabrescent; leaves opposite below, alternate above, often with axillary fascicles, linear-lanceolate or linear, 3.8 cm. long or less, greenish and strigose above, beneath white-tomentose; heads solitary at tips of stem and branches, medium-sized; involucre 9 mm. high, of lanceolate or lance-oblong, cinereously appressed-pubescent phyllaries, only their extreme tips loose; disk corollas yellow, with fuscous teeth.

Stems in clumps from a caudex, 40 cm. long and more, slender (2.5 mm. thick or less), alternate-branched, gray-barked, glabrate; branches thinly appressed-pilose, somewhat glandular, and toward the nodes often tuberculate-hispid; petioles pilose, 1.5 mm. long or less; blades of the principal leaves 2.3 to 3.8 cm. long, 4 to 6 mm. wide, usually acuminate to an obtuse apex, cuneate at base, somewhat falcate, entire or subentire, revolute-margined, subcoriaceous, above dull green, rather densely strigose to sparsely hispidulous with glandular-tuberculate-based hairs, somewhat glabrescent, beneath densely and loosely white-tomentose, triplinerved near base and feather-veined, the veins impressed above, evident beneath through the tomentum in age; leaves of the fascicles linear, about 1.5 cm. long, 1.5 mm. wide, or smaller; peduncles terminating stem and branches, 3 to 7 cm. long, naked or few-bracted, sordid-pilose and sparsely hispid below the heads; heads 3.5 cm. wide or less; disk hemispheric, 9 to (fruit) 14 mm. high, 1 to (fruit) 2 cm. thick (as pressed); involucre 3 to 4-seriate, graduate, 8 to 9 mm. high, the phyllaries lanceolate or oblong (outer) to oblong-lanceolate (the inner 1.5 to 2.5 mm. wide), appressed or (especially the outer) with spreading tips, the outer subherbaceous essentially throughout, densely appressed-pilose and somewhat hirsute, the others indurate and blackish below and there nearly glabrous except for the hirsute-ciliate margin, with shorter or longer obtuse to acutish herbaceous tips, these densely appressed-pilose, more or less ciliate, and somewhat glandular; rays about 9, yellow, neutral, pubescent on tube and on nerves of back, glandular between them, the tube 1 mm. long, the lamina oblong, 2-toothed, about 10-nerved, 15 mm. long, 5 mm. wide; disk corollas puberulous on lower part of tube, on nerves above, and on teeth, 7.3 mm. long (tube 1.2 mm., throat cylindrical, 5 mm., teeth ovate, 1.1 mm.); pales acuminate, often mucronulate, blackish above along costa, hispidulous above along keel and ciliate, about 9 mm. long; achenes oblong-obovate, compressed, glabrous, 3.3 mm. long, 1.5 mm. wide; awns 2, linear-subulate, hispidulous, caducous, about 2 mm. long.

Type in the herbarium of the Field Museum, no. 518724, collected on eastern side of canyon at Llata, Dept. Huánuco, Peru, alt. about 2135 meters, August 21, 1922, by J. F. Macbride and W. Featherstone (no. 2240). Duplicate in the U. S. National Herbarium, no. 1,198,892.

Allied to *Helianthus microphyllus* H. B. K. and *H. subniveus* Blake (*H. niveus* Hieron., not Brandeg.). In the former the involucre is only 5 mm. high, with oblong, apically tomentose phyllaries; in the latter it is 1 cm. long, and densely niveo-tomentose.

***Helianthus senex* Blake, sp. nov.**

Shrub; branches canescently long-villous, glabrescent; leaves mostly

opposite, broadly ovate, serrulate, petioled, cinereous-pilose above, densely white-tomentose beneath; heads medium-sized, solitary on axillary and terminal peduncles; involucre 8 mm. high, graduate, the phyllaries oblong, obtuse, canescent-tomentose especially above; disk corollas yellow throughout.

Shrub 1 meter high, growing in clumps; stem stout (4 to 7 mm. thick), with opposite or alternate branches, terete, in age glabrate and conspicuously lenticellate; branches very densely long-villous with loosely spreading or reflexed white hairs 2 to 3 mm. long and with slightly enlarged bases, glabrescent, striatulate; internodes mostly 0.5 to 2.5 cm. long; leaves chiefly opposite, alternate above on the flowering branches; petioles stout, 5 to 15 mm. long, unmarginated, densely pilose-tomentose; blades ovate, the larger 5 to 6.5 cm. long, 3 to 4 cm. wide, acute, broadly rounded at base and very shortly decurrent on the petiole, serrulate or crenate-serrulate above the entire base (teeth about 4 per cm.), thick-herbaceous, above densely cinereous-pilose with mostly spreading hairs with small glandular-tuberculate bases, beneath very densely and softly white-tomentose, triplinerved from near the base, the principal veins at first impressed, later prominulous above, beneath at length evident beneath the tomentum; branch leaves often smaller, yellowish above; peduncles axillary and terminal, 2 to 5 toward tips of branches, normally 1-headed, spreading-pilose, glabrescent, naked or few-bracted, 2 to 8 cm. long; heads 2 cm. wide; disk subglobose, 1 to 1.3 cm. high, 8 to 15 mm. thick; involucre 3 to 4-seriate, graduate, 7 to 8 mm. high, the phyllaries appressed or with very short spreading tips, oblong (1.3 to 2 mm. wide) or the outer oblong-ovate, obtuse, with indurated, blackish, pale-margined, glabrate (in the inner nearly glabrous) base and shorter, densely pilose-tomentose, herbaceous apex; rays about 8, small, yellow, neutral, pilose on tube and on nerves of back, the tube 1.5 mm. long, the lamina elliptic-oblong, 5 to 10 mm. long, 2 to 4 mm. wide, 3 or 4-denticulate, 9-nerved, sometimes bearing at base 2 appendages suggesting abortive stamens; disk corollas sparsely hispidulous chiefly on nerves above and on teeth, 6.3 mm. long (tube 1.3 mm., throat cylindric, 4.5 mm., teeth deltoid, 0.5 mm.); pales acute or acutish, callous-apiculate, not keeled, pilose and ciliate above, 11 mm. long or less; achenes oblong, compressed, blackish, glabrous, 3.5 mm. long, 1.3 mm. wide; awns 2, linear-lanceolate, hispidulous-serrulate, caducous, 3 mm. long.

Type in the herbarium of the Field Museum, no. 518,077, collected on canyon slope at Mito, Dept. Huánuco, Peru, alt. about 2745 meters, July 8-22, 1922, by J. F. Macbride and W. Featherstone (no. 1572). Duplicate in the U. S. National Herbarium, no. 1,198,884.

Nearest *Helianthus imbaburensis* Hieron., of Ecuador, which has alternate, acuminate, entire leaves and shorter sub-2-seriate involucre of more densely and uniformly pilose-tomentose phyllaries.

Helianthus viridior Blake, sp. nov.

Shrub, much branched, very leafy; branches appressed-pilose, glabrate; leaves chiefly alternate, lanceolate, short-petioled, subentire, appressed-subsericeous when young, soon glabrescent and green on both sides; heads medium-sized, solitary; involucre 1 cm. high, of lanceolate or lance-ovate acuminate phyllaries, densely pilose above; disk corollas with fuscous teeth.

Stem terete (5 mm. thick), gray-barked, lenticellate, glabrous, apparently procumbent, 30 cm. long and more, sending out numerous mostly simple or subsimple alternate ascending branches nearly or quite as long; young

branches warty, not densely appressed-pilose, the older gray-barked, glabrate or glabrescent; internodes on the older portions mostly 1 to 5 mm. long, on the younger mostly 1 to 2.5 cm.; leaves opposite at base of branches, alternate above; petioles slender, naked, appressed- or erectish-pilose, 3 to 8 mm. long; blades lanceolate, 3 to 4.3 cm. long, 5 to 13 mm. wide, acuminate to acutish, callous-apiculate, cuneate at base, entire or obscurely serrulate mostly above the middle, rather thin, triplinerved above the base, scarcely reticulate, above at first canescently subsericeous-pilose with appressed hairs, soon glabrescent, green, and evenly appressed- or antrorse-pilose (the hairs with scarcely enlarged glandular bases), beneath at first densely and canescently appressed-silky-pilose, soon green and loosely antrorse-pilose, usually narrowly revolute on margin; peduncles solitary, terminating stem and branches, 1-headed, appressed-pilose, naked or few-bracteate, 3.5 to 5 cm. long; heads about 3 cm. wide; disk subglobose, 1 to 1.3 cm. high and thick; involucre 3 to 4-seriate, graduate, 8 to 11 mm. high, the phyllaries lanceolate or linear-lanceolate (outer) to lance-ovate, mostly acuminate, with short callous blackish tips, rather densely and loosely pilose on their exposed portions and ciliate, appressed or with rather loose tips, the outermost subherbaceous and blackish green throughout, the others pale and multivittate below, with mostly longer blackish green tips; rays about 9, neutral, yellow, linear-elliptic, 9 to 12-nerved, 2 or 3-denticulate, pilose on tube and sparsely so on principal nerves of back, the tube 1.5 mm. long, the lamina about 15 mm. long, 3 to 4 mm. wide; disk corollas numerous, yellow with fuscous teeth, sparsely pilosulous on tube and back of teeth, 6 mm. long (tube 1 mm., throat cylindric, 4.3 mm., teeth triangular, acute, 0.7 mm.) pales acuminate, blackish above, sparsely pilose chiefly above, somewhat glandular on the sides, about 8 mm. long; infertile ovaries of the ray with a pappus of 2 or 3 lacerate squamellae 0.5 mm. long; disk achenes oblong, compressed, blackish, glabrous, 4 mm. long, 1.5 mm. wide; pappus of 2 caducous, lanceolate-acuminate, hispidulous-ciliolate awns 3 mm. long.

Type in the herbarium of the Field Museum, no. 517591, collected in crevices of a vertical limestone cliff at Tarma, Dept. Junin, Peru, alt. about 3965 meters, June 1-6, 1922, by J. F. Macbride and W. Featherstone (no. 1070). Duplicate in U. S. National Herbarium, no. 1,198,869.

Readily distinguished from the other Andean species by its lanceolate, glabrescent leaves.

Perymenium featherstonei Blake, sp. nov.

Shrub; branches strigillose; leaves lance-ovate, slender-petioled, acuminate, rounded at base, crenate-serrate, bullate and green above, densely griseous-tomentose beneath; heads small, slender-peduncled, in small cymes; involucre 5 mm. high, of broadly ovate, obtuse, strigillose phyllaries.

"Tree-shrub, 1.3 to 2.3 m. high, rather open but very erect," with opposite branches; stem subterete (3 to 6 mm. thick above), striatulate, lenticellate, glabrate, brownish or dark gray; internodes 1.5 to 6.5 cm. long; leaves opposite; petioles slender, naked, sulcate above, strigillose, appressed-pilose above, 5 to 12 mm. long; blades 5 to 8 cm. long, 1.5 to 3 cm. wide, crenate-serrate from above the short entire base to apex (teeth rounded, subequal, 4 to 5 per cm.), narrowly revolute-margined, subcoriaceous, above dull green, densely and harshly tuberculate-hispidulous with subappressed hairs, strongly bullate, beneath densely and rather softly griseously or cinereously pilose-tomentose except on the 3 chief nerves (these strigose), triplinerved 2 to 4 mm.

above base and reticulate, the veins and veinlets impressed above, the chief ones prominent beneath, the others mostly concealed by the tomentum; heads in cymes of 2 to 5 at tips of branches, subtended by reduced leaves, the pedicels angulate, strigillose, usually 1.5 to 4.5 cm. long; disk (in old fruit) subglobose, 6 to 7 mm. high, 7 to 9 mm. thick; involucre 3 to 4-seriate, graduate, 4 to 5.5 mm. high, appressed, the phyllaries broadly ovate or orbicular-ovate, obtuse, obscurely and shortly subherbaceous at apex, otherwise pale and indurated, strigillose and finely ciliolate; rays not seen; disk corollas (imperfect) about 3.2 mm. long; pales acutish to acuminate, narrow, strongly 1-ribbed, minutely hispidulous on keel, about 6 mm. long; ray achenes trigonous, hispidulous on angles and at apex, their pappus of 20 unequal, hispidulous, deciduous awns 1 to 1.8 mm. long; disk achenes obovoid-oblong, 2.5 to 3.2 mm. long, 1.5 mm. wide, biconvex, biauriculate at apex, narrowly whitish-margined, finely hispidulous especially on margin and at apex, fuscous, finely papillate, their pappus of 2 slender hispidulous awns 2.5 to 2.8 mm. long, on the angles, and about 12 similar shorter awns 1 mm. long or less, all deciduous.

Type in the herbarium of the Field Museum, no. 517839, collected in river canyon at Cabello, a hacienda 14.5 km. above Huertas, Dept. Junin, Peru, alt. 2440 meters, June 25, 1922, by J. F. Macbride and W. Featherstone (no. 1329). Duplicate in the U. S. National Herbarium, no. 1,198,875.

Allied to *Perymenium serratum* Blake, of the Province of Chachapoyas, which has a much larger involucre, 9 to 10 mm. high.

***Pappobolus cinerascens* Blake, sp. nov.**

Branches slender, cinerascens-pilosulous and sparsely pilose; leaves lance-ovate, subentire, green and rough above, densely cinereous-pilose beneath; heads 2 or 3, terminal, medium-sized; involucre cinerascens-puberulous and somewhat pilose, graduate, of lance-ovate acuminate phyllaries with reflexed herbaceous tips.

Herb (?); branches slender (2 mm. thick), simple, subterete, striatulate, pithy, densely cinerascens-pilosulous with chiefly spreading or reflexed hairs and sparsely spreading-pilose; internodes 4.5 to 7 cm. long; leaves opposite throughout, or those subtending the peduncles alternate; petioles naked, densely spreading-pilosulous and long-pilose, 4 to 13 mm. long; blades lance-ovate or lanceolate, 6 to 8 cm. long, 1.7 to 2.5 cm. wide, acuminate, falcate, at base cuneate or rounded, entire or obscurely and remotely serrulate, very narrowly revolute-margined, above blackish green, densely and harshly hirsutulous and hirsute with curved hairs with persistent tuberculate bases, maculate in age, beneath densely and softly subtomentose-pilose with antrorse hairs, triplinerved 1 to 2 mm. above base, the chief veins usually impressed above, prominulous beneath; heads 4 to 4.5 cm. wide, in terminal cymes of 2 or 3, the peduncles slender, naked or with a single bract, pubescent like the stem, 2 to 8.5 cm. long; disk depressed-subglobose, 1.2 cm. high, 1.5 to 2.3 cm. wide (as pressed); involucre 4 to 5-seriate, graduate, 7 to 9 mm. high, the phyllaries lance-ovate or lanceolate (1.5 to 2.5 mm. wide), with blackish green, ribbed and vittate base and longer to shorter, reflexed, acuminate, somewhat involute, callous-tipped, herbaceous apex, densely cinereous-puberulous (inside and outside) on their exposed surface, tuberculate-hispidulous above, more or less pilose dorsally above, ciliolate; rays 18 or more, yellow, neutral, pilosulous on tube and nerves of back, the tube slender, 2 mm. long, the lamina elliptic, 2.4 cm. long, 6 mm. wide, 9-

nerved, 2-dentate; disk flowers very numerous, their corollas yellow, fuscous on teeth, puberulous on nerves of throat and on teeth, 6.7 mm. long (tube 1.5 mm., throat slender-funnel-form, 4.2 mm., teeth ovate, 1 mm.); ray achenes (inane) with a caducous pappus of about 14 linear-lanceolate spinulose-serrulate unequal paleaceous awns 1.2 to 1.8 mm. long; disk achenes obovate-oblong, very strongly compressed, fuscous, glabrous, striatulate, 4 mm. long, 1.5 mm. wide, their pappus of about 16 caducous awns like those of the ray achenes, 1.8 to 2.8 mm. long, those on the angles the longest.

Type in the Kew Herbarium, collected in the Province of Chachapoyas, Peru, in 1836, by A. Mathews. Photograph and fragment of type in U. S. National Herbarium; duplicate in British Museum.

Allied to *Pappobolus mollicomus* Blake, also from Chachapoyas, with duplicate types of which (in Kew Herbarium and British Museum) it has been possible to compare it. In *P. mollicomus* the pubescence of stem and peduncles is much longer, being composed of long, spreading, tuberculate-based hairs, and the phyllaries are broader (3 to 4.5 mm. wide) and densely canescent-pilose, with longer spreading herbaceous tips. *Pappobolus macranthus* Blake, the type of the genus, is distinguished from the two other species by its usually broader, definitely serrate leaves, which are griseous-rather than canescent- or cinereous-pubescent beneath. It was described from Muña, Peru (wrongly "Bolivia" in the original description), and has been collected at Mito, Peru, 1922, by Macbride and Featherstone (no. 1384, a smaller-headed form than the original) and at Chaglia, Peru, 1923, by Macbride (no. 3646). All three localities are in the Department of Huánuco.

Oyedæa maculata Blake, sp. nov.

Shrub; branches densely scabrous-hispidulous; leaves oval or ovate-oval, acute, rounded at base, serrulate, very rough on both sides, triplinerved, short-petioled; heads medium-sized, 1 or 2 at tips of branches and in upper axils, short-peduncled; involucre 9 mm. high, of oblong, acuminate, herbaceous-tipped, scarcely spreading phyllaries.

Stem stout (5 mm. thick), striate, brownish, densely incurved- or appressed-hispidulous with tuberculate-based persistent hairs; internodes 5 to 20 mm. long; leaves opposite; petioles broad, densely tuberculate-hispidulous, 2 to 4 mm. long; blades 3.5 to 5 cm. long, 1.7 to 2.7 cm. wide, sparsely serrulate above the middle (teeth 3 to 5 pairs, 3 to 6 mm. apart), narrowly revolute-margined, firm and subcoriaceous, above brownish green, somewhat shining, evenly hispidulous with curved hairs with tuberculate or glandular-tuberculate persistent bases, beneath duller brownish green, evenly but not densely short-hispid on surface with spreading or slightly incurved hairs with small tuberculate bases, antrorse-hispid along the nerves, rather definitely triplinerved within 3 to 6 mm. of base (the lateral pair reaching slightly above middle of leaf) and with 6 to 8 other pairs of principal lateral nerves of which 1 or 2 are conspicuously stronger than the others, the nerves and veins impressed above, prominent or prominulous beneath; peduncles 1-headed, solitary, terminal and in the upper axils, pubescent like the stem, 6 to 12 mm. long; heads 3.8 cm. wide or less; disk hemispheric, 1 to 1.3 cm. high, 1.2 to 1.5 cm. thick (as pressed); involucre 8 to 10 mm. high, 3-seriate, slightly or scarcely graduate, the phyllaries oblong (2 to 2.5 mm. wide), erect or with slightly spreading tips, acuminate, callous-tipped, the outermost herbaceous throughout, rather sparsely tuberculate and short-hispid, 1-nerved, the others with pale, indurate, more or less hispidulous-ciliate, otherwise nearly glabrous

base, and subequal, glandular-tuberculate, sparsely hispidulous and hispid herbaceous tips; rays about 11, yellow, neutral, hispidulous on tube and back, the tube 2 mm. long, the lamina oblong-elliptic, bidentate, up to 2 cm. long, 5 mm. wide, about 11-nerved; disk corollas yellow, essentially glabrous except for the finely hispidulous teeth, 7 mm. long (tube 2 mm., throat cylindrical-funneliform, 4.2 mm., teeth ovate, 0.8 mm.); pales acuminate, keeled, hispidulous on the slightly greenish apex, about 9 mm. long; disk achenes obovate-oblong, compressed, biconvex, 4.5 mm. long, 2.2 mm. wide, fuscous, 2-winged (wings thick, about 0.3 mm. wide, hispidulous on margin), very sparsely strigillose; awns 2, very unequal, hispidulous, 1.8 to 4 mm. long; squamellae acute, unequal, lacerate, united below, 0.8 mm. long or less.

Type in the U. S. National Herbarium, no. 1,230,911, collected on the subparamo, Cerro de Turumiquire, Sucre, Venezuela, alt. 2975 meters, in 1925, by G. H. H. Tate (no. 232). Additional specimen, with the same data, collected under no. 233.

Related to *Oyedaea wedelioides* (Klatt) Blake, of Peru, and *O. jahnii* Blake, of the Province of Mérida, Venezuela. In the former the leaves are decidedly larger and borne on petioles 4 to 15 mm. long, the heads are several or numerous and cymose-panicled, and the phyllaries have spreading tips. In the latter the leaves are ovate or lance-ovate and much larger, and the heads are larger, solitary, and longer-peduncled.

Verbesina tatei Blake, sp. nov.

Section *Saubinetia*; stem stout, pithy, leafy, densely lanate-tomentose; leaves alternate, large, elliptic-oval, acute or acuminate at each end, repand-serrulate, stout-petioled, rough above, densely sordid-pilose beneath; heads medium-sized, yellow, radiate, many-flowered, numerous in a rounded terminal panicle; involucre about 8 mm. high, of oblong, obtuse, sordid-pilosulous phyllaries; rays about 5 mm. long.

Shrub or large herb; stem subterete, 8 mm. thick above, glabrate and yellowish brown below, densely lanate-tomentose above with dirty-white hairs; internodes about 1 cm. long; petioles 2 to 3 mm. thick, narrowly grooved beneath, densely lanate-tomentose, margined above the decurrent leaf base, the naked portion 2.5 to 3.5 cm. long; blades 12 to 20.5 cm. long, 4.5 to 8.5 cm. wide, thick-pergamentaceous, repand-serrulate above the entire cuneate base (teeth small, obtuse, 2 to 5 mm. apart), above dark green, evenly hirsutulous on surface with antrorse-curved hairs with small glandular-tuberculate persistent bases, hirsute-pilose along costa and chief veins, beneath brownish green, densely and rather softly ochroleucous-pilose on surface with curved hairs, very densely so on chief veins, featherveined, the chief lateral veins about 11 pairs, like the stout costa prominent beneath, the veinlets prominulous beneath, mostly impressed above; heads 1.8 cm. wide, about 32, on axillary and terminal peduncles, in a rounded panicle 11 cm. wide, about equaled by the leaves, the bracts small, the pedicels stout, 1.5 to 3 cm. long, densely sordid-pilose; disk subglobose, 1 cm. high, 1.3 cm. thick; involucre 3 to 4-seriate, graduate, 7 to 8 mm. high, appressed, the phyllaries oblong or the outermost ovate-oblong (1.5 to 3 mm. wide), obtuse, dark green, subherbaceous with (especially the inner) narrow pale margins, 1-nerved, sordid-pilosulous especially along costa and margin; rays 9 to 12, slightly exceeding disk, yellow, pistillate and bearing imperfect anthers, pilose on tube and nerves of back, 8.5 mm. long (including tube), 3 to 4 mm. wide; disk flowers about 75, their corollas yellow, pilose on tube and teeth

with several-celled acuminate hairs, glabrous on throat, 6 mm. long (tube 1.3 mm., throat subcylindric, 3.7 mm., teeth ovate, 1 mm.); pales pilose on the narrow keel and margin and on the yellowish, somewhat spreading or recurved, subscarious obtuse apex, about 7.5 mm. long; immature disk achenes obovate, compressed, scarcely winged, ciliate, sparsely pubescent above, 2.8 mm. long; awns, 2, subequal, stout, trigonous, hispidulous on keel, 4.5 mm. long.

Type in the U. S. National Herbarium, no. 1,230,946, collected on an exposed ridge, Cerro de Turumiquire, Sucre, Venezuela, alt. 1830 meters, in 1925, by G. H. H. Tate (no. 350).

In pubescence, foliage, and inflorescence this species is strikingly like *Verbesina crassiramea* Blake of Colombia, a member of the Section *Lipactinia* with discoid, 5 to 14-flowered heads. Its closest ally, however, is the long-doubtful *V. humboldtii* Spreng. (*V. helianthoides* H. B. K., not Michx.) of Colombia. In the latter the stem is ascending-pilose to spreading-pilosulous, the internodes are longer, the petioles margined nearly to base, the leaves less densely and softly pubescent beneath, the heads much larger, the rays longer and apparently white, the phyllaries of the somewhat longer involucre distinctly broader, and the pales essentially glabrous (except for the more or less ciliate margin) on the thin acute or acuminate tip.

Verbesina humboldtii Spreng. was left among the doubtful species by Robinson and Greenman in their revision of the genus. It was described (as *V. helianthoides* H. B. K.) from "Regno Quitensi?," and is represented in the Paris Herbarium by at least two sheets of the original material. Hieronymus at first³ referred to it *Lehmann* 7481 from Colombia, but later⁴ described this as a new species, *V. lehmannii*, distinguishing it from *V. humboldtii* by several supposed differential characters derived from the original description of the latter. During the summer of 1925 I examined the type material of *V. helianthoides* H. B. K. at Paris and a specimen of *Lehmann* 7481 at Kew, and, through the courtesy of the curators of these herbaria, obtained photographs and small fragments of both specimens. Study of these shows that Hieronymus' species can not be maintained as distinct from *V. humboldtii*. *Triana* 1381, from Bogotá, alt. 2,300 meters, which I have on loan from the British Museum and the Kew Herbarium, belongs to the same species. The position of *V. humboldtii* is somewhat difficult to settle satisfactorily. So far as the size of the rays indicates, it might be placed as a small-flowered *Verbesinaria* (as was done by Hieronymus) or a large-flowered *Saubinetia* (in the Paris specimens I recorded the rays as only 7 mm. long), but their white color would refer it rather to *Ochractinia* in Robinson and Greenman's treatment. One or two species of *Saubinetia* (particularly *V. semidecurrens* Kuntze, of which *V. soratae* Schultz Bip. is a synonym) are now known to have white rays, however, and the best position for *V. humboldtii* is probably in this group among the species numbered 68 to 79 in Robinson and Greenman's treatment, from all of which it is distinct.

In three heads of *Verbesina tatei* examined the rays were all intermediate in form and structure between normal rays and disk corollas, being hermaphrodite and imperfectly ligulate. The short proper tube, at the apex of which are inserted the very unequal, nearly free, and non-polliniferous stamens, is continued into a funnellform throat shorter than the proper lamina. The latter is equally or unequally 3-toothed, and sometimes bears a large

³ Bot. Jahrb. ENGLER 19: 54. 1894.

⁴ Bot. Jahrb. ENGLER 23: 612. 1901.

lateral lobe and a much smaller one, or the other two segments of the corolla are represented by two small and unsymmetrically placed teeth on one side of the apex of the throat. The style branches bear elongate hispidulous sterile appendages. Although the condition is doubtless abnormal, and not characteristic of the species, it is of interest as showing how easy is the transition from the tubular 5-toothed disk corolla, the theoretical type of the asteraceous corolla, to the 3-toothed pistillate ligule.

Verbesina oligactis Blake, sp. nov.

Section *OchRACTINIA*; tall; stem wingless, densely spreading-pilose with yellowish hairs; leaves alternate, large, oblong-elliptic, acuminate at each end, obscurely denticulate, tuberculate-pilosulous above, densely short-pilose beneath especially along the veins, short-petioled; heads small, very numerous, white, in a large terminal panicle, sessile or short-pedicelled; rays 1 or 2, disk flowers 11 to 13.

Tall herb (?); stem stout (6 mm. thick above), striate-angulate, pithy, densely spreading-pilose with yellowish-white hairs about 1 mm. long; internodes about 1 cm. long; petioles stout, densely pubescent like the stem, the unmarginated portion 3 to 5 mm. long; blades 20 to 25 cm. long, 4 to 7 cm. wide, long-cuneate at base, remotely denticulate with small blunt callous teeth (0.3 mm. high, 3 to 8 mm. apart), papery, above dull green, evenly antrorse-pilosulous with yellowish-white hairs with glandular-tuberculate persistent bases, densely short-pilose along costa, beneath densely griseous- or flavescent-pilose along the chief veins with spreading several-celled hairs, less densely so on all the veins and veinlets, featherveined, the chief lateral veins 10 to 12 pairs, rather prominent beneath, the chief veinlets prominulous; panicle terminal, flattish, very many-headed, 20 cm. wide, pubescent like the stem, the bracts small (mostly 3.5 cm. long or less), definitely serrulate with dark callous teeth, the pedicels usually 2 mm. long or less, sometimes up to 6 mm.; heads 6 to 8 mm. wide; disk obovoid, 4.5 to 6 mm. high, 3 to 4.5 mm. thick; involucre 2-seriate, unequal, 3 mm. high, the phyllaries few, lance-oblong or oblong (about 1 mm. wide), obtuse, appressed, thickened and subherbaceous at base, with longer, thinner, submembranous, pale tip, loosely and rather sparsely pilosulous and ciliolate; rays 1 or 2, white, pistillate, the tube pilose, 1.5 mm. long, the lamina oblong, 4.8 mm. long, 2 mm. wide, nearly glabrous, 3-denticulate, 7-nerved; disk flowers 11 to 13, their corollas white, blackish green below the teeth, pilose on tube and throat, glabrous on teeth, 4 mm. long (tube 1 mm., throat cylindrical-funnelform, 2.5 mm., teeth ovate, papillose-margined, 0.5 mm.); pales submembranous, blackish green with subscarios margins, pilosulous, ciliate above, subtruncate or with short blunt erect or slightly spreading glabrous apiculation, about 5 mm. long; disk achenes (immature) ciliate, pilose especially above, narrowly winged, 2.8 mm. long; awns 2, unequal, hispidulous, 2.2 to 2.7 mm. long.

Type in the Kew Herbarium, collected at San Miguel, Sierra Nevada of Santa Marta, Colombia, November 1844, by William Purdie. Photograph and fragments in U. S. National Herbarium.

A member of the *Verbesina punctata* group, nearest *V. synethes* Blake, also a Colombian species, which has thicker heads, containing 8 rays and about 29 disk flowers, borne on pedicels 7 to 14 mm. long. Similar also to *V. callacatensis* Hieron., of the Section *Lipactinia*, in which the heads sometimes bear as many as 3 very small rays. In that species the petioles are always auriculate at base, the heads are considerably larger, and the involucre is densely pubescent.